

IN THE CLAIMS:

1. (Original) An organic electroluminescent device having an anode (2), a cathode (3), and an intermediate element (7), which is set between the anode (2) and the cathode (3) and comprises at least one hole-transporting organic material, and at least one electron-transporting organic material; the electron-transporting organic material and the hole-transporting organic material being designed to form between them exciplexes or electroplexes; the device (1) being characterized in that said intermediate element (7) comprises at least one luminophore material; the luminophore material being designed to emit electromagnetic radiation; the luminophore material being supplied, in use, for transfer of energy from said exciplexes or electroplexes.

2. (Currently amended) The device of claim according to Claim 1, wherein said intermediate element (7) essentially includes a first layer (4), which comprises the hole-transporting organic material and is set in contact with the anode (2), and a second layer (6), which comprises the electron-transporting organic material and is set in contact with said cathode (3) and said first layer (4).

3. (Currently amended) The device of claim according to Claim 2, wherein said first layer (4) comprises the luminophore material.

4. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said anode (2) is substantially transparent.

5. (Currently amended) The device of claim 2 according to any one of Claims 2 to 4, wherein said first layer (4) comprises polycarbonate (PC).

6. (Currently amended) The device of claim 1 according to any one of Claims 2 to 5, wherein said electron-transporting organic material has a first ionization potential and said hole-

transporting organic material has a second ionization potential; the first ionization potential being higher by at least 0.7 eV than the second ionization potential.

7. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said electron-transporting organic material has a first electronic affinity and said hole-transporting organic material has a second electronic affinity; the first electronic affinity being higher by at least 0.4 eV than the second electronic affinity.

8. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said luminophore material comprises at least one metallocyclic compound, which satisfies the structural formula M L L' L'', in which M represents a transition metal, L, L' and L'' represent, each independently of the others, a chelating ligand, which satisfies the structural formula:



in which Y represents an electron-donor heteroatom.

9. (Currently amended) The device of claim according to Claim 8, wherein M represents iridium (Ir).

10. (Currently amended) The device of claim 8 according to either Claim 8 or Claim 9, wherein M is positively formally charged.

11. (Currently amended) The device of claim 1 according to any one of Claims 1 to 7, wherein said luminophore material comprises at least one metallocyclic compound, which satisfies the structural formula M' L L', in which M' represents a transition metal, L and L'

represent, each independently of the other, a chelating ligand, which satisfies the structural formula:

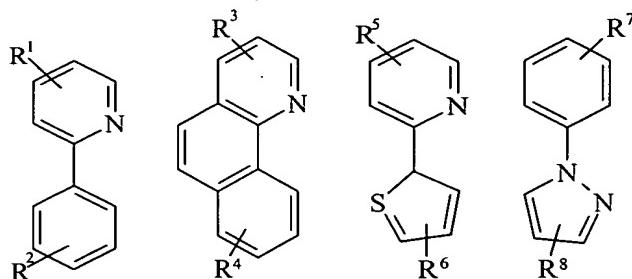


in which Y represents an electron-donor heteroatom; M' representing a transition metal chosen in the group consisting of:

- platinum (Pt); and
- palladium (Pd).

12. (Currently amended) The device of claim according to Claim 11, wherein M' is positively formally charged.

13. (Currently amended) The device of claim 8 according to any one of Claims 8 to 12, wherein the chelating ligands L, L' and L'' satisfy, each independently of the others, a structural formula chosen in the group consisting of:



in which R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> represent, each independently of the others, one chosen from among:

- an alkyl group,

- an aryl group,
- a condensate ring, or
- a hydrogen atom;

L, L' and L'' being negatively formally charged.

14. (Currently amended) The device of claim 8 according to any one of Claims 8, 9, 10 and 13, wherein said metallocyclic compound is iridium tris (2-phenylpyridine) ( $\text{Ir}(\text{ppy})_3$ ).

15. (Currently amended) The device of claim 11 according to any one of Claims 11 to 13, wherein said metallocyclic compound is chosen in the group consisting of:

- platinum bis (2-thienylpyridine); and
- platinum bis (2-phenylpyridine).

16. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said luminophore material comprises at least one organometallic complex which satisfies the structural formula:



in which n is comprised between 1 and 3, each Q is, independently of the other Qs, a quinoline derivative, and each A is, independently of the other As, a phenol derivative, and in which M'' is a metal, having a positive formal charge, chosen in the group consisting of:

- aluminium (Al), and
- gallium (Ga).

17. (Currently amended) The device of claim according to Claim 16, wherein the organometallic complex is alumino bis (phenol)(8-hydroxyquinaldine) ( $\text{Alqfen}_2$ ).

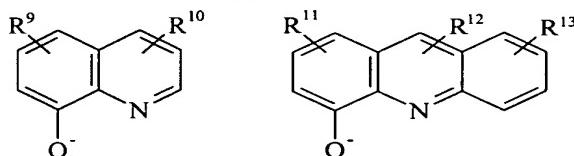
18. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said luminophore material comprises at least one organometallic complex, which satisfies the structural formula:



in which m is 1 or 2, each Q is, independently of the other Qs, a quinoline derivative, and each A is, independently of the other As, a phenol derivative, and in which M''' is a metal, having a positive formal charge, chosen in the group consisting of:

- zinc (Zn), and
- beryllium (Be).

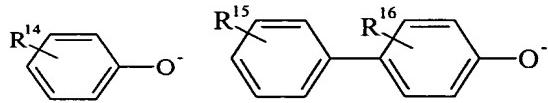
19. (Currently amended) The device of claim 16 according to Claim 16 or Claim 18, wherein each Q represents, independently of the other Qs, a quinoline derivative, which satisfies a structural formula chosen in the group consisting of:



in which R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

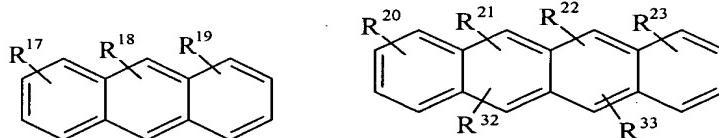
20. (Currently amended) The device of claim 16 according to any one of Claims 16 to 19, wherein each A is a phenol derivative, which satisfies, independently of the other As, a structural formula chosen in the group consisting of:



in which R<sup>14</sup>, R<sup>15</sup> and R<sup>16</sup> represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

21. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said luminophore material comprises at least one aromatic hydrocarbon with condensate rings, which satisfies a structural formula chosen in the group consisting of:

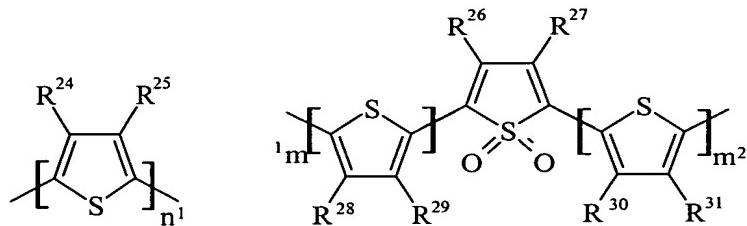


in which R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup>, R<sup>20</sup>, R<sup>21</sup>, R<sup>22</sup>, R<sup>23</sup>, R<sup>32</sup> and R<sup>33</sup> represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

22 (Currently amended) The device of claim according to Claim 21, wherein said aromatic hydrocarbon with condensate rings is rubrene.

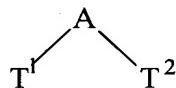
23. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said luminophore material comprises at least one thiophene derivative which satisfies a structural formula chosen in the group consisting of:



in which n<sup>1</sup> is an integer comprised between 3 and 7, m<sup>1</sup> and m<sup>2</sup> are, each independently of the other, integers comprised between 1 and 3, in which R<sup>24</sup>, R<sup>25</sup>, R<sup>26</sup>, R<sup>27</sup>, R<sup>28</sup>, R<sup>29</sup>, R<sup>30</sup> and R<sup>31</sup> represent, each independently of the others, one chosen from among:

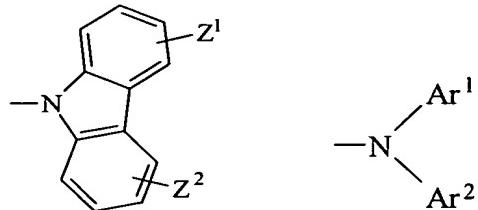
- an alkyl group,
- a hydrogen atom, or
- an aryl group.

24. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said hole-transporting organic material is substantially represented by a tertiary aromatic amine; the tertiary aromatic amine satisfying the structural formula:



in which T<sup>1</sup> and T<sup>2</sup> represent, each independently of the other, a tertiary amine; and in which A represents an aryl group.

25. (Currently amended) The device of claim according to Claim 24, wherein T<sup>1</sup> and T<sup>2</sup> represent, each independently of the other, a tertiary amine which satisfies a structural formula chosen in the group consisting of:



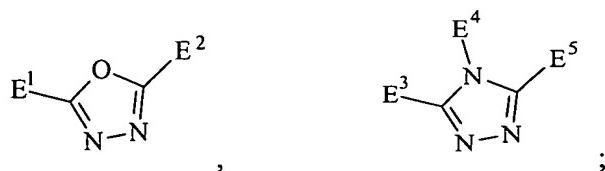
in which Z<sup>1</sup> and Z<sup>2</sup>, represent, each independently of the other, one chosen from among:

- an alkyl group,
- an alcohol group, or
- a hydrogen atom;

in which Ar<sup>1</sup> and Ar<sup>2</sup> represent, each independently of the other, an aryl group.

26. (Currently amended) The device of claim 24 according to Claim 24 or Claim 25, wherein said hole-transporting organic material comprises 4,4',4''-tris (N-3-methylphenyl-N-phenylamino)-triphenylamine (m-MTDATA).

27. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said electron-transporting organic material is substantially constituted by a heterocyclic compound which satisfies a structural formula chosen in the group consisting of:



in which E<sup>1</sup>, E<sup>2</sup>, E<sup>3</sup>, E<sup>4</sup> and E<sup>5</sup> represent, each independently of the others, an aryl group.

28. (Currently amended) The device of claim 1 according to any one of the preceding claims, wherein said electron-transporting organic material comprises 2-(4-biphenyl)-5-phenyl-1,3,4-oxadiazole (PBD).

29. (Original) A method for producing an organic electroluminescent device; the method comprising a depositing step for depositing an intermediate element (7) on an anode (2); and an apposition step for positioning a cathode (3) on said intermediate element (7); the intermediate element (7) comprising at least one luminophore material; the luminophore material being designed to emit electromagnetic radiation; the method being characterized in that said intermediate element (7) comprises at least one hole-transporting organic material and at least one electron-transporting organic material; the electron-transporting organic material and the hole-transporting organic material being designed to form between them exciplexes or electroplexes; the luminophore material being supplied, in use, for transfer of energy from said exciplexes or electroplexes.

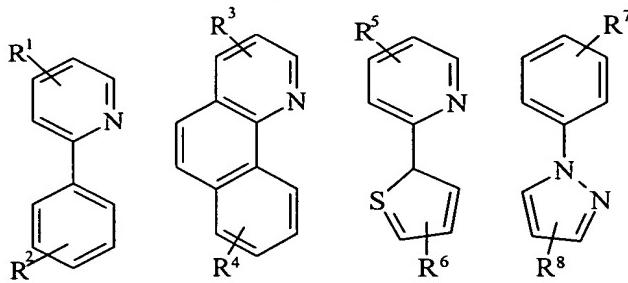
30. (Currently amended) The method of claim according to Claim 29, wherein said luminophore material is chosen so that said electromagnetic radiation is of a given wavelength.

31. (Currently amended) The method of claim 29 according to Claim 29 or 30, wherein said depositing step comprises a first depositing substep for depositing said first layer (4) on an anode (2); and a second depositing substep for depositing the second layer (6) on the first layer (4); of positioning a cathode (3) on said second layer (6).

32. (Currently amended) The method of claim according to Claim 31, wherein, during said first depositing substep, said luminophore material is deposited.

33. (Currently amended) The method of claim 31 according to ~~Claim 31 or 32~~, wherein, during said first depositing substep polycarbonate, is deposited.

34. (Currently added) The device of claim 11, wherein the chelating ligands L, L' and L'' satisfy, each independently of the others, a structural formula chosen in the group consisting of:

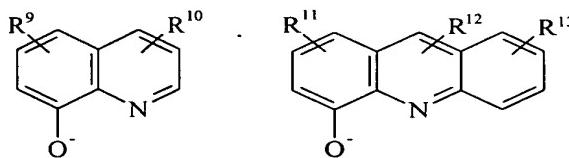


in which R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup> represent, each independently of the others, one chosen from among:

- an alkyl group,
- an aryl group,
- a condensate ring, or
- a hydrogen atom;

L, L' and L'' being negatively formally charged.

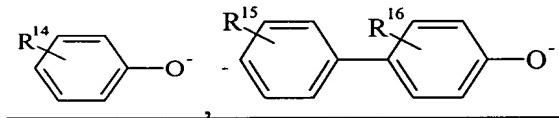
35. (Currently added) The device of claim 18, wherein each Q represents, independently of the other Qs, a quinoline derivative, which satisfies a structural formula chosen in the group consisting of:



in which  $R^9$ ,  $R^{10}$ ,  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

36. (Currently added) The device of claim 18, wherein each A is a phenol derivative, which satisfies, independently of the other As, a structural formula chosen in the group consisting of:



in which  $R^{14}$ ,  $R^{15}$  and  $R^{16}$  represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.